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APPLICATION FOR LETTER PATENT

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OVER A COMMUNICATION NETWORK

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BACKGROUND OF THE INVENTION

This invention relates to delivering information to the subscribers on a communication network, more particularly to a technique for dynamically delivering information to each active subscriber on the network without interfering with the reception and display of their selected data or program from the network.

In a typical communication network in which advertisements or other information are delivered, such as a conventional cable television network, a local area network (LAN), a wide area network (WAN) and the internet, the delivery of advertisements interferes with the reception and/or display of subscribers' selected program or data.

In a conventional cable television network and a conventional on-demand video distribution system, the messages are incorporated into the transmission data stream representing the program selected by the subscriber. That is, the transmission and/or display of the selected program is interrupted for commercial breaks.

In the internet, the information is downloaded ("pushed") on to the subscriber's terminal such that the display of the pushed information interferes with the display of the

subscriber's selected data. That is, the pushed information is placed on top of the data (e.g., frames or page of data from a web site) that is being currently displayed on the subscriber's terminal.

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However, it is desirable to continuously display "pushed" information, messages or advertisements simultaneously with the subscriber's selected data or program wherein they do not interfere with each other and are simultaneously viewable by the subscriber.

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Also, in a typical communication network, the information such as advertisements are delivered to many subscribers indiscriminately. This is disadvantageous for the subscribers because some subscribers are subjected to advertisements in which they have no interest. It is also disadvantageous to the advertisers because the advertisers must pay to deliver the advertisement to a large audience of subscribers including the subscribers they desire to reach and the subscribers who have no interest in their advertisement.

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It is desirable to target information, such as messages, announcements, advertisements, etc., to subscribers who

are more likely to be interested in such information and deliver that information to only those selected subscribers.

Techniques have been proposed heretofore for selective
5 distribution of messages over communication networks, such as a
conventional cable television network and a conventional on-
demand video distribution system. In a conventional cable
television network, an addressable controller communicates with a
plurality of subscriber converters on the network. Each
10 converter, i.e., set-top converter box, is assigned as a member
of a primary message group and may also be assigned to one or
more message subgroups. The messages are input to the
addressable controller for subsequent transmission to a converter
for display on a television receiver connected to that converter.
15 The head end tags the text messages with distribution data
defining at least one primary message group or message subgroup
to receive the message. Various primary groups are used to
segregate converters based on geographical area or distribution
hub, and subgroups are used to segregate subscribers into groups
20 of particular interest. The tagged text messages are transmitted
over the conventional cable television network together with
broadcast signals from network service providers on separate
paths or channels. A particular converter determines whether it
is authorized to receive the tagged text message. If it is

determined that this particular converter is authorized to receive the tagged text message, the converter either immediately displays the tagged text message by blocking the display of the broadcast signals on the selected (tuned) channel or overlays alphanumeric characters and/or graphics on top of the program being displayed on the subscriber's television receiver.

In a conventional on-demand video distribution system, a technique has been proposed in which commercial messages to be distributed over the network contain embedded information identifying categories of recipients for each message. A server, centrally located on the network, selectively tags commercial messages with the converter addresses of subscribers, satisfying the identifying categories. The commercial messages are inserted into the video signal associated with the video program selected by a particular addressed converter (subscriber) and transmitted over the network for receipt and display by a television receiver connected to that addressed converter. The addressed converters receive and display the commercials on their corresponding television receiver during scheduled commercial breaks in the program. The addresses are selected by the server based on information stored in a database related to demographic and other information relating to the household of the subscriber in comparison to the same information relating to households which

are actual customers of the product or service which is a subject of the commercial.

5 However, it is desirable to continuously display the text messages or commercials along with the program on the subscriber's television receiver. The present invention proceeds upon the desirability of continuously displaying the messages simultaneously with the broadcast program in which the broadcast program and the messages do not interfere with each other and are simultaneously viewable by the subscriber.

Also, it is desirable to update the demographic information based on viewing habits, purchasing behavior and the like because the demographic information may become stale over time.

20 A customized information file is dynamically generated for each active subscribers on the network in accordance with the corresponding subscriber profile data stored in a database. Each customized information file containing a plurality of addresses of the information, e.g., messages, announcements, advertisements, etc., are sent to the corresponding subscriber. Each active subscriber terminal sequentially displays the

information located in the addresses found in its customized information list.

OBJECTS OF THE INVENTION

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Therefore, it is an object of the present invention to provide an apparatus and technique for delivering information to subscribers on a communication network such that the information and the subscriber's selected data is simultaneously viewable by the subscriber.

Another object of this invention is to provide an apparatus and technique as aforesaid, which additionally displays the information without interfering with the reception and display of the subscriber's selected data.

Additional object of the present invention is to provide a technique for targeting information to subscribers who are more likely to be interested in a particular information and delivering that information to only those targeted (selected) subscribers.

Various other objects, advantages and features of the present invention will become readily apparent from the ensuing

detailed description, and the novel features will be particularly pointed out in the appended claims.

SUMMARY OF THE INVENTION

5 In accordance with this invention, a processing device connected to a communication network continuously displays a sequence of information received from a plurality of INFO sources simultaneously with data selected from at least one data provider on the network such that the sequence of information and the selected data are simultaneously viewable by the subscriber. Although the subscriber may select data from on or more data providers, the subscriber cannot control the display of the sequence of information.

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15 In a preferred embodiment, the sequence of information is continuously displayed without interfering with the display of the selected data.

20 In accordance with yet another aspect of this invention, a sequence of information is uniquely generated for each subscriber in accordance with the subscriber's profile data. A processing device associated with the subscriber continuously displays the sequence of information simultaneously with data selected from at least one data provider on the network such that

the sequence of information and the selected data are simultaneously viewable by the subscriber. Although the subscriber may select data from on or more data providers, the subscriber cannot control the display of the sequence of information.

Preferably, the sequence of information is continuously displayed in one portion of the monitor associated with the processing device and the selected data is displayed in another portion of the monitor.

BRIEF DESCRIPTION OF THE DRAWINGS

The following detailed description, given by way of example, and not intended to limit the present invention solely thereto, will best be understood in conjunction with the accompanying drawings in which:

Fig. 1 is a block diagram showing the incorporation of the present invention in a world wide web (internet);

Fig. 2 is a block diagram representing an embodiment of a terminal of Fig. 1 depicting the three portions of the monitor;

Fig. 3 is a block diagram representing an embodiment of an INFO window and a browser window of Fig. 2;

Fig. 4 is a block diagram showing the incorporation of the present invention in a cable television network;

Fig. 5 is a block diagram of an embodiment of a television receiving apparatus of Fig. 4;

Fig. 6 is a block diagram of an embodiment of the INFO window and a program window of Fig. 5.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The present invention is readily implemented by presently available communication apparatus and electronic components. The invention finds ready application in virtually all commercial communication networks, including but not limited to over-the-air broadcasts, local area network (LAN), wide area network (WAN), intranet, world wide web (internet), wired cable transmission systems and direct satellite broadcast systems.

Turning now to Fig. 1, there is illustrated a block diagram of a computer network, specifically internet (world wide

web), which incorporates the present invention. An internet
service provider (ISP) server 110, INFO servers 120, INFO
databases 121, a profile database 122, subscriber terminals 130,
data providers, such as an IBM server 140 and a FORD server 150,
5 a session usage server 210, a name/password database 220, a
session usage database 230, an INFO display database 240, a
clicked event server 250, a clicked event database 260, a session
log server 270, a primary session log database 280, a profile
server 285 and an additional profile database 286 are connected
10 to each other to form an internet 100. It is appreciated that
the internet contemplated in the present invention is not limited
to the internet shown in Fig. 1. Fig. 1 is merely a simplified
representation of the internet and it is appreciated that a
numerous number of servers may be connected to form the internet.

20 The individual subscriber terminal 130 includes a
monitor 180 and an input device 170 such as keyboard, mouse or
like. Although not described in detail, it will be appreciated
that the terminal may be a conventional computer, such as an ibm-
compatible personal computer (PC), a network computer, an Apple
Macintosh computer or like.

The profile data representing the demographic of the
subscriber is stored in the profile database 122. The profile

data may comprise home address, business address, length of residence, household income, gender, age group, the frequency of internet or cable use, but is not limited to such. It is appreciated that the profile data may be supplied via a telephone to a representative of the internet service provider, entered on the input device 170 of the subscriber terminal 130, obtained from a questionnaire profile form completed by the subscriber or by other comparable means. If the profile data is entered on the input device 170 by the subscriber, the subscriber terminal 130 transmits the profile data to the ISP server 110. The profile data may be encrypted and compressed before it is transmitted to the ISP server 110.

The ISP server 110 forwards and stores the received profile data in the profile database 122. The ISP server 110 may also decrypt and decompress the received profile data before storing the profile data in the profile database 122. Also, from time to time, additional demographic information may be requested from the subscribers and this additional demographic information may be stored with the profile data in the profile database 122 or separately in the additional profile database 286.

If the additional profile data is entered on the input device 170 by the subscriber, the subscriber terminal 130

transmits the additional profile data to the ISP server 110. The additional profile data may be encrypted and compressed before it is transmitted to the ISP server 110. The ISP server 110 forwards and stores the received additional profile data in the additional profile database 286 or the profile database 122..
5 Alternatively, the ISP server 110 may forward the additional profile data to the profile server 285 which decrypts and decompresses the received additional profile data, and stores the additional profile data in the additional profile database 286.

The INFO servers 120 continuously transmit information, such as advertisements, news, messages, web pages, data packets, stock tickers, announcements, updates and like, to form a sequence of information. It is appreciated that the information may comprise but is not limited to texts, still pictures, moving pictures, video and audio components, or a combination thereof. This sequence of information is supplied to the ISP server 110 for distribution to the subscribers. It is appreciated that the one or more INFO servers may represent web channels, e.g., travel
15 channel, weather channel, etc. In such a case, the INFO servers 120 continuously transmit information relating to travel or weather. It is also appreciated that each INFO server 120 may include an INFO database 121 wherein the information for distribution is stored. In such a case, each INFO server 120
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retrieves the information from its respective INFO database 121 and transmits the retrieved information to the subscribers on the network.

5 Alternatively, the sequence of information is selected for each subscriber in accordance with the subscriber's profile data which may also include the additional profile data. That is, a sequence of information is dynamically and individually generated for each subscriber. For example, if an advertiser chooses to target its advertisements to males under 40 years of age with annual incomes exceeding \$50,000, then these advertisements could be distributed to only those subscribers satisfying these demographic requirements. It is appreciated that a part or all of the subscriber's profile data containing various demographic information may be used to generate the sequence of information.

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20 Preferably, the ISP server 110 may retrieve a sequence of INFO IDs or a sequence of INFO addresses from an INFO list database 125 for distribution to the subscribers. The sequence of INFO IDs may contain a list of INFO IDs uniquely identifying each information in the sequence of information; INFO durations representing the length of time each information is to be displayed to the subscribers, e.g., display the information for

30 seconds; and display time ranges representing the time of the day that each information is to be displayed to the subscribers, e.g., display the information within 7:00 PM to 8:00 PM.

5 Additionally, the sequence of INFO addresses may contain a list of addresses indicating the location of each information in the INFO servers 120, INFO durations, display time ranges. The ISP server 110 transmits the sequence of INFO IDs or addresses to the subscriber terminals 130 which stores the received sequence in a local storage device (not shown).

10 In accordance with a preferred embodiment of the present invention, the ISP server 110 may generate a customized and individualized sequence of INFO IDs or addresses for each subscriber in accordance with the subscriber's profile data which may also include the additional profile data. That is, a sequence of INFO IDs or addresses is dynamically and individually generated for each subscriber. It is appreciated that this sequence of INFO IDs or addresses may be pre-generated for each subscriber during off-peak hours and provided to the subscriber's terminal 130 when it connects to the ISP server 110 or dynamically generated for each subscriber when the subscriber's terminal successfully connects to the ISP server 110. This customized sequence of INFO IDs or addresses is then transmitted to the subscriber terminal 130 associated with that subscriber

and to the session usage server 210 which stores the received sequence for that subscriber in the session usage database 230.

5 The individual subscriber terminals or processing
devices 130 then reads the information located in these addresses
or corresponding to the INFO IDs and displays the read
information as the sequence of information for the INFO duration
specified during the display time ranges. In other words, these
addresses may represent URLs (uniform resource locators) or the
10 like and the subscriber terminal 130 reads the web pages from the
INFO servers 120 corresponding to these URLs and displays them as
the sequence of information from 7:00 PM to 8:00 PM. For
example, if a particular information has INFO duration of 30
seconds, then each time this particular information is displayed
15 during the display time period (range), the information is
displayed for 30 seconds.

20 Also, the profile data may contain information relating
to the subscriber's time zone which can be used to generate the
sequence of information. For example, if a particular
information has a display time range of 6:00 PM to 7:00 PM and
the current time is 9:00 PM EST (Eastern Standard Time), then
this information would not be provided to any U.S. subscribers in

the EST time zone, but would be supplied to U.S. subscribers in the Pacific time zone.

Individual subscriber terminals 130, i.e., authorized subscribers to the ISP, are connected to the ISP server 110 by telephone lines 160, which can be constructed as ordinary telephone lines, ISDN lines, or T1 lines. It is appreciated that the subscriber terminals 130 may be connected to the ISP server 110 by cables, which can be constructed as either coaxial cables, optical fiber cables, or a combination thereof. Also, it is appreciated that the connection between the ISP server 110 and each subscriber terminal 130 may be a wireless connection.

It is noted that only authorized subscribers, i.e., authorized subscriber terminals 130, are permitted to be connected to the ISP server 110 and unauthorized subscriber terminals are inhibited from displaying the sequence of information received from the INFO servers 120. Each subscriber is assigned a unique subscriber ID and a password, which are stored in the name/password database 220 or like accessible by the ISP server 110. Alternatively, each subscriber terminal 130 may be assigned a unique subscriber ID and a password.

5 The subscriber enters a subscriber ID and a password on the input device 170 to initiate a connection between the subscriber terminal 130 and the ISP server 110. The subscriber terminal 130 transmits the subscriber ID and the password to the ISP server 110 which forwards them to the name/password database 220 for verification. Preferably, the subscriber ID and the password is compressed and encrypted using standard compression and encryption techniques before it is transmitted to the ISP server 110. The name/password database 220 decrypts and decompresses the compressed and encrypted subscriber ID and the password before they are stored.

15 The name/password database 220 first determines whether the received subscriber ID matches one of the stored subscriber IDs. If a match is found for the subscriber ID, then the name/password database 220 further determines whether received password matches the stored password associated with that subscriber ID. If match is also found for the password, then the subscriber is determined to be an authorized subscriber, and the connection between the subscriber terminal 130 and the ISP server 110 is established. Additionally, the subscriber terminal 130 is categorized as an authorized subscriber terminal and login information for that authorized subscriber is generated and stored in the session usage database 230 or like. It is

appreciated that subscriber terminal 130 may store the login information in a local storage device (not shown) before transmitting the login information to the session usage database. The login information may comprise a login time and a login date, but is not limited to such information. For example, the login information may additionally contain a location ID, information relating to the locality of that subscriber terminal 130. It is appreciated that the location ID may represent a zip code, a telephone number, a country name or code, a state or province name, or like. Alternatively, the login information may be transmitted to the session usage server 210 which generates a session usage record from the login information and stores the session usage record in the session usage database 230. It is appreciated that the session usage record may not necessarily contain all the login information.

Also, it is appreciated that the login time and the login date may be generated in accordance with a network system clock, thereby ensuring accurate and uniform login information from the subscriber terminals 130. The network system clock may reside in the ISP server 110 or some other server on the internet 100. Accordingly, the clock information of each subscriber terminal is not overwritten with the network system clock information, but each subscriber terminal time stamps the

information to be transmitted to the ISP server 110 based on the network system clock. That is, each subscriber terminal 130 has a real time and a virtual time based on the network system clock, and generates a virtual login time and a virtual login date based on the network system clock.

However, if no match is found for the subscriber ID or the password, then the subscriber is determined to be an unauthorized subscriber, and the connection is not established between the subscriber terminal 130 and the ISP server 110. Additionally, the subscriber terminal 130 is categorized as an unauthorized subscriber terminal.

In accordance with the preferred embodiment, the subscriber also selects an access phone number using the input device 170 to initiate a connection between the subscriber terminal 130 and the ISP server 110 using that access phone number. It is contemplated that a phone database 225 connected to the internet 100 contains all of the access phone numbers that can be used to connect to the ISP server 110 along with the zip codes and time zones that are associated with each access phone number. Additionally, a pre-assigned zip code is stored for each access phone number in the phone database 225.

Once the connection has been successfully established between the subscriber terminal 130 and the ISP server 110 using the selected access phone number, the ISP server 110 requests zip code information of the subscriber terminal 130 from the name/password database 220. The received zip code is forwarded to the phone database 225 to determine whether the received zip code is associated with the entered access phone number. If it is determined that the received zip code is associated with the selected access phone number, then the subscriber is presumed to be logging in from his/her home and the received zip code is used as a location zip code. However, if it is determined that the received zip code is not associated with the selected access phone number, then the subscriber is presumed to be logging in from a remote location and the pre-assigned zip code associated with the selected access phone number is used as the location zip code.

It is appreciated that the access phone number and the location zip code of the subscriber, and the time zone corresponding to the location zip code of the subscriber can also be used to generate the sequence of information for that subscriber. For example, if a particular information has a display time range of 6:00 PM to 8:00 PM and the current time is 9:00 PM EST (Eastern Standard Time), then this information would

not be provided to any U.S. subscribers in the EST time zone, but would be supplied to U.S. subscribers in the Mountain and Pacific time zones. This will advantageously permit the advertisers to target their advertisements based on the geographic location of the subscriber to consider regional preferences. That is, advertisers may want to use one advertisement for people in the east coast and another advertisement for people in the west coast.

The authorized subscriber enters an URL on the input device 170 to request a web page from the host server (or data provider) on the internet 100. It is appreciated that each host server on the internet is uniquely identified by a host server name which is referred hereinafter as a data provider ID. For example, to request a web page from the IBM server 140 on the internet 100, the authorized subscriber enters the following URL, "http://www.ibm.com", on the input device 170. The subscriber terminal 130 supplies the requested URL to the ISP server 110. It is appreciated that the requested URLs received from the unauthorized subscriber terminals are rejected by the ISP server 110 and not forwarded to the host server. This effectively inhibits the unauthorized subscriber terminals from displaying the web page from the host server.

The ISP server 110 retransmits the request for a web page from the authorized subscriber terminals 130 to the IBM server 140 via the internet 100. In response to the request, the IBM server 140 supplies the requested web page to the ISP server 110. The ISP server 110 then retransmits the web page to the appropriate subscriber terminal 130.

The subscriber terminal 130 continuously displays on the monitor 180 the sequence of information simultaneously with the requested web page received from the IBM server 140 via the ISP server 110. It is contemplated that the sequence of information and the requested web page are displayed on the monitor 180 such that they are simultaneously viewable by the subscriber.

Preferably, the display of the sequence of information on the monitor 180 does not interfere with the display of the requested web page. In such a scheme, the sequence of information may be displayed in a first portion of the monitor 180 and the requested web page in a second portion of the monitor 180. For simplicity, the two portions of the monitor 180 will be referred hereinafter as a browser window 190 and an INFO window 200 as depicted in Fig. 2. Accordingly, the sequence of information is displayed in the INFO window 200 and the requested

web page is displayed in the browser window 190. It is appreciated that each information in the sequence is displayed on the INFO window 200 for the assigned INFO duration, e.g., first information may be displayed for 30 seconds, second information
5 for 15 seconds, etc.

Alternatively, the monitor 180 may be divided into three portions, namely the browser window 190, the INFO window 200 and a navigation window 290. The navigation window may include clickable buttons 291, channel button 292 to select preferred channels, locator field 293, a GO button 294, a back button 295 to move to previous web page, a forward button 296 to move to the next web page, a home button 297 to retrieve the subscriber's selected home page, a preference button 298 to enter, modify and update the subscriber's profile data and a logo button 299 to connect a pre-assigned web page. It is appreciated that more buttons providing different functions and features may be incorporated into the navigation window 290.

20 The subscriber may use the preference button 298 to select the preferred system attributes such as the preferred home page, the display settings, the modem settings, the memory allocation or the like. Also, the preference button 298 may be used to modify passwords, access phone numbers or the like.

5 The URL entered by the authorized subscriber on the input device 170 to request a web page from the host server appears on the locator field 293. Instead of entering the complete URL, the user may instead enter an incomplete URL by simply entering the host name of the desired host server with or without the name of the domain, and press the GO button 294. The present invention contextually determines the remaining (or missing) components of the incomplete URL to form a complete URL. That is, if the subscriber enters "ibm.com," the subscriber terminal 130 contextually determines the complete URL as "http://www.ibm.com" and supplies the complete URL to the ISP server 110.

15 However, if the subscriber simply enters "ibm," then the subscriber terminal 130 first determines the appropriate domain of the host server "ibm" and then contextually determines the complete URL. It is noted that currently the following domains exist in the internet for the United States: com, gov, edu, org, and net. For other countries, these domains are followed by country code, such as org.kr for Korea and org.de for Germany. It is also noted that the host servers are distributed between these various domains, thus the subscriber terminal 130 determines the appropriate domain based on the probability distribution of the host servers in a particular domain. That

is, the subscriber terminal 130 determines the probability of finding the entered host server in these various domains and then selects the one with the highest probability. If it is determined that the host server does not reside in the selected domain, the subscriber terminal 130 selects another domain having the next highest probability until the domain is found for the entered host server.

Each of the clickable buttons 291 corresponds to one component of the URL, such as "http://", "www.", ".com", ".net" and the like as shown in Fig. 2. Instead of simply entering the host name, the subscriber may enter the host name and click one or more clickable buttons 291 for the missing components of the URL, and the subscriber terminal 130 contextually determines the appropriate URL. For example, if the subscriber enters "ibm" and clicks the "http://" button, the subscriber terminal 130 contextually determines the complete URL as "http://www.ibm.com" for the IBM web site. If the subscriber clicks the ".gov" button and enters "irs", the subscriber terminal 130 contextually determines the complete URL as "http://www.irs.gov" for the IRS web site. It is appreciated that the components of the URL need not be entered in its proper sequential order. Regardless of the order the URL components are entered, the present invention

contextually determines the complete URL in its proper sequential order.

Also, the INFO window 200 may include unlinked regions 202 and linked regions 201 such as "Corporate News", "Merchandise", "New Products" or "Order Now" as shown in Fig. 2. Each of the linked regions 201 may be linked to a host server (a data provider) on the internet 100. The subscriber may click one of the linked regions 201 to receive additional information relating to corporate news, merchandise, new products or to place an order. For example, if the subscriber clicks the linked region 201 labeled "Corporate News" in Fig. 2, the subscriber terminal 130 will be connected to the Coca-Cola corporate news web page containing corporate news information which will be displayed on the browser window 190. Alternatively, if the subscriber clicks the linked region 201 labeled "Corporate News," the subscriber may receive this additional information via e-mail, fax, mail or like. Preferably, the additional information displayed in the browser window 190 may depend on the subscriber's profile data. For example, if the subscriber checks on the linked region 201 labeled "New Products" to receive additional information on the latest golf gloves, the subscriber terminal 130 may request the subscriber's profile data from the profile database 122 to determine whether the subscriber is left-

handed or right-handed. If it is determined that the subscriber is left-handed then only golf-gloves for left-handed people are displayed in the browser window 190. It is appreciated that the linked regions 201 are not limited to those depicted in Fig. 2 and other linked regions are contemplated in the present invention.

As illustrated in Fig. 3, if the subscriber clicks one of the linked regions 201 of the INFO window 200, a pop-up window, a pull-down menu or like may appear in the browser window wherein the subscriber may be requested to complete a questionnaire form or provide requested data to receive the additional information. For example, the subscriber may be requested to provide an e-mail address, street address, fax number or the like to receive additional information. It is appreciated that the subscriber may provide another person's e-mail address so that the other person may receive the additional information via e-mail. Also, it is appreciated that the requested data may be retrieved from the profile database 122 and displayed in the browser window 190. The subscriber may accept (confirm) this retrieved data or modify the data so as to provide the additional information to another person. After the requested data is either entered or selected by the subscriber,

the subscriber terminal 130 transmits the requested data or completed questionnaire form to the ISP server 110.

Preferably, the ISP server 110 transmits the completed
5 questionnaire form or the requested data to the profile server
285 to store or update the subscriber's additional profile
information in the additional profile database 286.
Alternatively, the ISP server 110 retrieves the profile data
associated with the subscriber from the profile database 122 and
10 transmits the completed questionnaire form along with the
subscriber ID and the subscriber's profile data to the profile
server 285. The profile server 285 then stores or updates the
subscriber's additional profile information in the additional
profile database 286. It is appreciated that this advantageously
15 permits the present invention to provide a mechanism for
interactive communication between the subscriber and the INFO
provider. Also, other means of providing the requested data are
contemplated such as a radio button for exclusive selections,
check boxes for multiple selections and like.

20
It is appreciated that although the subscriber cannot
control the display of the sequence of information on the INFO
window 200 of the monitor 180, the subscriber can select another
web page to be displayed on the browser window 190 by entering

another URL such as "http://www.ford.com" on the input device
170. The display of the web page from the IBM server 140 on the
browser window 190 is replaced with the web page from the FORD
server 150. That is, the requested web page received from the
5 FORD server 150 is now displayed in the browser window 190
without affecting the display of the INFO window 200.

Alternatively, the contents of the INFO window 200,
each information in the sequence of information, can be
characterized as an unsolicited request for a web page (data)
from one of the host servers, such as the IBM server 140. In
other words, the materials displayed on the browser window 190
represent solicited web pages requested by the subscriber,
whereas the materials displayed on the INFO window 200 represent
unsolicited web pages not requested by the subscriber.
Essentially, without informing the subscriber, the subscriber
terminal 130 automatically transmits an URL to request a web page
to be displayed on the INFO window 200 from a host server.

20 Preferably, the host servers may be divided into two
groups, wherein each group of servers accepts only one type of
requests. That is, the first group of servers may accept only
solicited request for web pages and the second group accepts only
unsolicited request for web pages. Any solicited request for web

pages from the second group of servers is denied and the browser window 190 may display a message such as "requested URL unavailable".

5 When the connection between the subscriber terminal 130 and the ISP server 110 is determined to be terminated, the ISP server 110 generates logout information and stores the information in the session usage database 230. It is appreciated that the subscriber terminal may store the logout information in the local storage device (not shown) before transmitting the
10 logout information to the session usage database 230. The logout information may comprise a logout time and a logout date, but is not limited to such information. Alternatively, each subscriber terminal 130 may generate the logout information if the
15 connection between the subscriber terminal 130 and the ISP server 110 is terminated by the subscriber. It is appreciated that each subscriber terminal 130 may generate the logout time and the
20 logout date using the virtual clock rather than its internal clock to ensure accurate and uniform logout information.

 Alternatively, the ISP server 110 transmits the logout information to the session usage server 210. The session usage server 210 generates session duration information as a function of the subscriber's stored login date, the subscriber's stored

login time, the received logout date and the received logout time. The session usage server 210 updates the session usage record of the subscriber in response to the received logout date, the received logout time and the session duration information, and stores the updated session usage record in the session usage database 230. The updated session usage record of the subscriber may be used along with the subscriber's profile data to select the sequence of information for the subscriber. That is, the data generated from the current session for the subscriber may be used to generate the sequence of information for the next session. It is noted that the current session implies the subscriber's current connection to the ISP server 110.

It is appreciated that the subscriber terminal 130 may be disconnected from the ISP server 110 due to faulty connection, hardware and software problems, power outage, etc. Preferably, to account for such disconnections, each subscriber terminal 130 generates a ping signal every predetermined interval, e.g., every 5, 10 or 15 minutes, and transmits the ping signal to the ISP server 110. It is appreciated that the ping signal may include information identifying the source of the ping signal, such as the subscriber ID.

5 The ISP server 110 forwards the ping signal to the session usage database 230. It is contemplated that the session usage database 230 stores information relating to the expected time of the next ping signal for each subscriber. When a subscriber terminal 130 successfully connects to the ISP server 110, the session usage database 230 sets the expected time of the next ping signal for that subscriber to the current time plus a multiple number of the predetermined ping signal interval. That is, upon the receipt of login information from a subscriber terminal 130, the session usage database 230 sets the expected time of the next ping signal for that subscriber.

15 If a ping signal is received substantially within the expected time from a subscriber terminal 130, then the session usage database 230 updates the expected time of the next ping signal for that subscriber. Preferably, the ISP server 110 may transmit the ping signal to the session usage server 210 which forwards the ping signal to the session usage database 230 for processing and storage. However, if a ping signal is not received substantially within the expected time from that subscriber terminal 130, then the connection between that subscriber terminal 130 and the ISP server 110 is presumed to be terminated. Preferably, the session usage server 210 transmits a disconnect signal to the ISP server 110 to disconnect that

subscriber terminal 130 from the ISP server 110. The session
usage server 210 also generates and transmits the logout
information for that subscriber to the session usage database 230
for storage. It is appreciated that the disconnect signal and
5 logout information may be generated by the ISP server 110 and
transmitted to the session database 230 for storage.

It is appreciated that for transmission efficiency and
security the ping signal may be encrypted and compressed using
standard encryption and compression techniques before it is
transmitted to the ISP server 110. In such a scenario, the
session usage server 210 decrypts and decompresses the ping
signal before updating the expected time of the next ping signal.

Since the information displayed to the subscribers may
represent advertisements, it may be important to keep track of
what advertisements were transmitted and displayed to the
subscribers. This information may be used to directly determine
the number of people who viewed a particular advertisement. It
is appreciated that this is comparable to Nielsen's or Arbitron's
rating scheme for television and radio, except that the present
technique provides a more precise and detailed measurement of the
viewing habits of the subscribers. That is, the present
technique advantageously permits a more accurate demographic

profile to be developed for each subscriber, thereby enabling the advertisers to selectively target their advertisements with greater precision.

5 Accordingly, for each subscriber, the present invention determines which information in the sequence of information was displayed to that subscriber based on the INFO durations and the subscriber's session usage record stored in the session usage database 230. Specifically, the subscriber's stored session duration information or the subscriber's stored login time, stored login date, stored logout time and stored logout date of the subscriber's session usage record may be used to determine which information was displayed on the subscriber terminal 130. The result of this determination may be compiled as a list to provide a list of displayed information. This list of displayed information is then stored in an INFO display database 240 or the like. It is appreciated that this list of displayed information for each subscriber may be a list of INFO IDs and INFO durations corresponding to the information that was displayed to that subscriber.

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The list of displayed information for each subscriber may additionally contain the subscriber ID and information relating to the display date and display time that a particular

information in that list of displayed information was displayed to that subscriber. It is appreciated that the display date and the display time information may be derived from the INFO durations and the subscriber's session usage record stored in the session usage database 230, namely from subscriber's login time, login date, logout time and logout date.

The list of displayed information for each subscriber may further contain information relating to the locality of that subscriber terminal 130, namely the location ID. Alternatively, the list of displayed information for each subscriber may be transmitted to the session usage server 210 which generates an INFO display record for each INFO ID in that list of displayed information and stores the INFO display record in the INFO display database 240. It is appreciated that the session usage server 210 may not necessarily use all of the information contained in the list of displayed information to generate the INFO display record. Also, the INFO display record of the subscriber may be used along with the subscriber's profile data to select the sequence of information for the subscriber. That is, the information displayed to the subscriber in his/her current session may be used to generate the sequence of information for the next session.

In addition, for each displayed information, the present invention keeps track of all of the linked regions 201 selected (or clicked) by each subscriber during the display of that information to provide a linked region ID. This information
5 may be used to determine the subscriber's interest in a particular product, company, channel or like, providing a more accurate information on the viewing habits of the subscriber. Also, this information may be used to develop a targeted advertising strategy, where the advertisers can determine the subscribers who are more likely to be interested in receiving such information. It is appreciated that since each linked region 201 is connected to a particular host server, each linked region ID may represent a selected host server ID (or a selected data provider ID).

If it is determined that at least one linked region 201 has been selected by a subscriber, the subscriber terminal 130 associated with that subscriber generates and transmits a clicked event report packet to the ISP server 110. It is appreciated
20 that the subscriber terminal 130 may store the clicked event report packet in the local storage device (not shown) before transmitting the clicked event report packet to the ISP server 110. The clicked event report packet may contain the subscriber ID of the subscriber terminal 130, the displayed INFO ID of the

displayed information, the selected data provider ID
corresponding to the clicked linked region 201, the date and time
the information was displayed on the subscriber terminal 130 to
provide the display date and the display time of the displayed
5 information, and the location ID defining the locality of the
subscriber terminal 130. It is appreciated that the subscriber
terminal 130 may generate the display date and display time using
the virtual clock rather than its internal clock to ensure
accurate and uniform information. Also, it is appreciated that
the clicked event report packet may be encrypted and compressed
before it is transmitted to the ISP server 110 for transmission
efficiency and security purposes.

The ISP server 110 forwards and stores the received
clicked event report packet in the clicked event database 260.
Alternatively, the ISP server 110 may forward the clicked event
report packet to the clicked event server 250 which decrypts and
decompresses the received clicked event report packet, and
generates a clicked event record. The clicked event record is
20 then stored in the clicked event database 260. It is appreciated
that the clicked event server 250 may not necessarily use all of
the information in the clicked event report packet to generate
the clicked event record. Also, the clicked event record of the
subscriber may be used along with the subscriber's profile data

to select the sequence of information for the subscriber. That is, the information selected by the subscriber in his/her current session may be used to generate the sequence of information for the next session.

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Further, it may be advantageous to keep track of the web sites (host servers) visited by the subscriber to develop a more precise profile on each subscriber. Thereby, enabling the advertisers to better select their target audience (subscribers) for their promotions, advertisements and like.

Accordingly, for each subscriber, the present invention determines all the host servers selected by that subscriber and stores the corresponding data provider IDs in the primary session log database 280. It is appreciated that each time a requested web page (data) is successfully retrieved from the host server and displayed on the browser window 190, the subscriber terminal 130 associated with that subscriber may generate and transmit a session log packet to the ISP server 110. It is appreciated that the subscriber terminal 130 may store the session log packet in the local storage device (not shown) before transmitting the session log packet to the ISP server 110. The session log packet may contain the subscriber ID of the subscriber terminal 130, the data provider ID of the host server selected by the subscriber,

the date and time the requested web page was displayed on the subscriber terminal 130 to provide the display date and the display time of the requested web page, and the location ID defining the locality of the subscriber terminal 130. Also, it is appreciated that the subscriber terminal 130 may generate the display date and display time using the virtual clock rather than its internal clock to ensure accurate and uniform information. Further, it is appreciated that the session log packet may be encrypted and compressed before it is transmitted to the ISP server 110.

The ISP server 110 forwards and stores the received session log packet in the primary session log database 280. Alternatively, the ISP server 110 may forward the session log packet to the session log server 270 which decrypts and decompresses the received session log packet, and generates a primary data display record. The primary data display record is then stored in the primary session log database 280.

Also, the session log server 270 may retrieve the profile data from the profile database 122 using the subscriber ID and additionally generate a secondary data display record substituting the subscriber ID information in the primary data display record with the profile data information associated with

that subscriber ID. The secondary data display record is then stored in the secondary session log database 281. That is, the session log server 270 may combine information from the different databases to generate a customized record. For example, a record
5 may be created to provide viewing habits of subscribers belonging to a particular demographic group such as single female under 30 with annual income exceeding \$100,000 living in Florida. It is appreciated that the session log server 270 may not necessarily use all of the information in the session log packet to generate the primary and secondary data display records.

Further, the data display record of the subscriber may be used along with the subscriber's profile data to select the sequence of information for the subscriber. That is, the web
15 site visited by the subscriber in his/her current session may be used to generate the sequence of information for the next session.

Turning now to Fig. 4, there is illustrated a block
20 diagram of a cable television network which incorporates the present invention. The apparatus illustrated in Fig. 4 may be included in a set-top converter, a television receiver, a video recorder or other conventional apparatus typically used to receive and cause the display of television pictures. A

broadcasting station 300 transmits broadcasting signals to a satellite 310 (for example, a broadcasting or communication satellite). These broadcasting signals are retransmitted to head-ends 320 disposed in individual service areas, each of which
5 may contain an antenna to receive the broadcasting signals, a receiving amplifier, an image source input portion (if necessary), a modulator to modulate the received broadcasting signals, and a multiplexer to multiplex the output of the modulator before it is output to a transmission line.

Individual homes 330, i.e., subscribers to the cable television system, are connected to a single head-end 320 by a cable 340, which can be constructed as either a coaxial cable, an optical fiber cable, or a combination thereof. For simplicity,
10 the head-end 320 that a particular home 330 (or a particular television receiving apparatus 350) is connected to is referred to hereinafter as the associated head-end 320. The cable 340 is connected in a tree shape or in a star shape. It is appreciated that the individual homes 330 may be connected to head-end 320
15 via wireless connection, satellite connection or like. A subscriber of the cable television system (home 330) is provided with a processing device such as a television receiving apparatus 350, which contains a tuner 390 for permanently tuning to
20 information channels broadcasting the sequence of information and

selectively tuning to a desired broadcast channel. It is appreciated that the tuner 390 may comprise multiple tuners such that one tuner may be used to tune to the desired broadcast channel and other tuners may be used to tune to the information channels. The received broadcast signals which constitute the program received from the broadcasting station 300 are supplied to a monitor 370 (Fig. 5) whereat it is displayed to the viewer (i.e., members of subscriber's household). It will be appreciated that the monitor 370 includes the usual video processing circuitry normally provided in television receiving apparatus or high definition television (HDTV) to permit a television picture (and accompanying audio information) to be displayed to a viewer.

The cable television network according to the present invention is not limited to the cable television network shown in Fig. 4. For example, a plurality of program providers (i.e., data providers) can transmit programs and a plurality of INFO servers 360 can transmit information such as advertisements and like to the satellite 310. A cable television station may be interposed between the satellite 310 and the head-ends 320 to receive broadcasting signals from the satellite 310 and relay those signals to the head-ends by optical fiber cables. Each head end is connected to homes of authorized subscribers by

optical fiber cables or coaxial cables. In addition, the present invention may be applied to a video image communication system such as a TV conference system, a satellite communication system or like.

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The broadcasting signal generated in the head-end 320 contains a plurality of broadcast channels (i.e., data providers) which are encoded for example using motion compensated inter-frame prediction coding techniques. Highly efficient encoders are utilized in the head-end 320 (not shown) in accordance with the MPEG (Moving Picture Experts Group) or MPEG2 system that has been adopted by the ISO (international Organization for Standardization). The encoded broadcast signals may be time-division multiplexed into a packet, which is digitally modulated, for example, using a PSK modulation technique.

Turning to Fig. 5, the television receiving apparatus 350 may be included in a set-top converter, a television receiver or other conventional apparatus typically used to receive and cause the display of television pictures. An input device 450 is adapted to receive input from the subscriber. For example, the input device 450 may be used by the subscriber to respond to a query from the cable system provider, to request modification to

the existing service such as adding or deleting a premium channel, etc.

5 A remote control unit 440 is adapted to transmit conventional control signals to the television receiving apparatus for controlling various functions such as channel selection, volume control, brightness, contrast, color adjustments, etc. Such control signals may be transmitted by infra-red transmission; and in that event the remote control unit includes an IR transmitter (not shown) and the television receiving apparatus includes a remote IR receiver 430. Alternatively, remote control unit 440 and remote IR receiver 430 may be omitted and the aforementioned control signals may be generated simply by operating corresponding controls directly on the television receiving apparatus (e.g., channel selector 420, a volume adjustment button, a picture control button and the like).

15 20 The control signals, whether received by remote IR receiver 430 or generated by control elements provided directly on the television receiving apparatus, such as channel selector 420, are coupled to a microprocessor 410 which controls the operation of a tuner 390 to tune to a selected television channel received at the input of the tuner. For example, the microprocessor may control tuner 390 to tune to a particular

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5 broadcast frequency over which a television program is
transmitted. Alternatively, the microprocessor 410 may control
tuner 390 to tune to a particular digital channel (as in direct
satellite broadcast transmission) over which the television
program is transmitted. The video signals which constitute the
television program broadcast over the selected channel are
supplied to the monitor 370 whereat they are displayed to the
subscriber. It will be appreciated that the monitor 370 includes
the usual video processing circuitry normally provided in
television receiving apparatus to permit a television picture
(and accompanying audio information) to be displayed to a viewer.
The foregoing operation is typical of television receiving
apparatus.

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20 Although not described in detail, it will be
appreciated that the microprocessor may be a conventional
microprocessor, such as a relatively inexpensive, small eight-bit
controller or a powerful, high-speed microprocessor for example,
a "486"-type microprocessor or Pentium microprocessor
manufactured by Intel Corp.

Returning to Fig. 4, each head-end 320 may also include
a profile database 325, wherein the profile data representing the
demographic of the subscriber is stored. As stated hereinabove

with respect to the internet, the profile data may comprise home address, business address, length of residence, household income, gender, age group, the frequency of internet or cable use, but is not limited to such. The profile data may be supplied via a
5 telephone to a representative of the cable television system, entered on the input device 450 of the television receiving apparatus 350, obtained from a questionnaire profile form completed by the subscriber or by other comparable means. If the profile data is entered on the input device 450 by the
10 subscriber, the television receiving apparatus 350 transmits the profile data to the associated head-end 320 via the cable 340 or a dedicated channel or a data link 341. It is appreciated that the profile data may be encrypted and compressed before it is transmitted to the associated head-end 320.

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20 The head-end 320 decrypts and decompresses the receive profile data, and forwards the decrypted and decompressed profile data to profile database 325 for storage. Alternatively, the decrypted and decompressed profile data may be stored in a central profile database (not shown) which is accessible by each head-end 320. Also, from time to time, additional demographic information may be requested from the subscribers and these additional demographic information may be stored with the profile

data in the profile database 325 or separately in the additional profile database 326.

5 If the additional profile data is entered on the input device 450 by the subscriber, the television receiving apparatus 350 transmits the additional profile data to the associated head-end 320. The additional profile data may be encrypted and compressed before it is transmitted to the television receiving apparatus 350. The head-end 320 decrypts and decompresses the received additional profile data, and stores the additional profile data in the additional profile database 326 or the profile database 325.

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20 Excluding the information channel, each broadcast channel contains a plurality of programs which are encoded so that only authorized subscribers of the cable television system may receive the broadcast programs. The information channel contains a plurality of information, such as advertisements, news, messages, announcements, updates and like, which are continuously broadcasted to the subscribers of the cable television system to form a sequence of information. The information may comprise but is not limited to texts, still pictures, moving pictures, video and audio components, or a combination thereof. It is appreciated that information from

numerous information channels may be multiplexed and distributed to the subscribers. The encoding technique normally depends on each channel.

5 In accordance with the present invention, the information channel may receive a plurality of information from the INFO servers 360. Each INFO server may include a storage device 365 or like. The information to be broadcasted on the information channel is first retrieved from the respective storage device 365 and supplied to the information channel for distribution to the subscribers.

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20 Alternatively, the sequence of information is selected for each subscriber in accordance with the subscriber's profile data which may also include the additional profile data. That is, a sequence of information is dynamically and individually generated for each subscriber. For example, if an advertiser chooses to target its advertisements to single females under 30 years of age with annual incomes exceeding \$50,000, then these advertisements could be distributed to only those subscribers satisfying these demographic requirements. As stated hereinabove with respect to the internet, a part or all of the subscriber's profile data containing various demographic information may be used to generate the sequence of information.

As stated hereinabove with respect to the internet, for each information in the sequence, the respective storage device 365 may contain the INFO duration representing the length of time the information is to be displayed to the subscribers, e.g., display the information for 30 seconds; and the display time range representing the time of the day that the information is to be displayed to the subscribers, e.g., display the information within 7:00 PM to 8:00 PM. Accordingly, each INFO server 360 may transmit only those information satisfying the display time range requirements of the information as a part of the sequence of information to a particular subscriber. The sequence of information is selected for each subscriber based on the subscriber's profile data and the display time range of the information. In other words, the microprocessor 410 (Fig. 5) controls the tuner 390 (Fig. 5) to tune to a particular INFO channel to receive the sequence of information selected for that subscriber. It is appreciated that each subscriber may be categorized into groups based on the subscriber's profile data and each INFO channel is associated with a particular group.

Also, the profile data may contain information relating to the subscriber's time zone which can be used to generate the sequence of information. For example, if a particular information has a display time range of 6:00 PM to 8:00 PM and

the current time is 9:00 PM EST (Eastern Standard Time), then this information would not be provided to any subscribers in the EST time zone, but would be supplied to subscribers in the Mountain and Pacific time zones.

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Preferably, as stated hereinabove with respect to the ISP server 110 (Fig. 1), the associated head-end 320 may retrieve a sequence of INFO IDs from an INFO list database 327 for distribution to the subscribers. The sequence of INFO IDs may contain a list of the INFO IDs uniquely identifying each information in the sequence of information; the INFO durations representing the length of time each information is to be displayed to the subscribers; and display time ranges representing the time of the day that each information is to be displayed to the subscribers. The associated head-end 320 may transmit the sequence of INFO IDs to the television receiving apparatus 350 which stores the received sequence in a local storage device 415 (Fig. 5).

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In accordance with the preferred embodiment of the present invention, the associated head-end 320 may generate a customized and individualized sequence of INFO IDs for each subscriber in accordance with the subscriber's profile data which may also include the additional profile data. That is, a

sequence of INFO IDs is dynamically and individually generated for each subscriber. It is appreciated that this sequence of INFO IDs may be pre-generated for each subscriber during off-peak hours and provided to the subscriber's television receiving apparatus 350 when it is "turn on" or dynamically generated for each subscriber as part of the "logging in" process, i.e., when the television receiving apparatus "turns on" to connect to the cable network. This customized sequence of INFO IDs is then transmitted to the television receiving apparatus 350 associated with that subscriber. The television receiving apparatus 350 stores the received sequence of INFO IDs in the local storage device 415 (Fig. 5).

The microprocessor 410 (Fig. 5) of the television receiving apparatus 350 may request information corresponding to stored INFO IDs over the dedicated channel or data link 341 from the associated head-end 320 to which the television receiving apparatus 350. It is appreciated that the request for information may include more than one INFO ID and the subscriber ID of the television receiving apparatus 350. The associated head-end 320 forwards the request to the INFO server 360 which retrieves the requested information corresponding to the INFO ID from the storage device 365. The requested information is then transmitted to the associated head-end 320 for distribution to

the requesting television receiving apparatus 350. The associated head-end 320 transmits the requested information to the television receiving apparatus 350 via the dedicated channel or data link 341. The microprocessor 410 stores the requested information in a local storage device 415 and supplies the requested information to the monitor 370 to be displayed to the subscriber. It is appreciated that the microprocessor 410 may request and store the information in advance from the associated head-end 320 in the local storage device 415 such that the information to be displayed is always available from the local storage device 415.

Alternatively, the associated head-end 320 may retrieve a sequence of channel IDs from an INFO list database 327 for distribution to the subscribers. The sequence of channel IDs may contain a list of the channel IDs uniquely identifying the information channel wherein the information may be received from the associated head-end 320 and the INFO durations representing the length of time the information receivable on each information channel corresponding to the channel IDs is to be displayed to the subscribers. The associated head-end 320 may transmit the sequence of channel IDs to the television receiving apparatus 350 which stores the received sequence in a local storage device 415 (Fig. 5).

In accordance with the preferred embodiment of the present invention, the associated head-end 320 may generate a customized and individualized sequence of channel IDs for each subscriber in accordance with the subscriber's profile data which may also include the additional profile data. That is, a sequence of channel IDs is dynamically and individually generated for each subscriber. It is appreciated that this sequence of channel IDs may be pre-generated for each subscriber during off-peak hours and provided to the subscriber's television receiving apparatus 350 when it is "turn on" or dynamically generated for each subscriber as part of the "logging in" process, i.e., when the television receiving apparatus "turns on" to connect to the cable network. This customized sequence of channel IDs is then transmitted to the television receiving apparatus 350 associated with that subscriber and to a session usage server 510 which stores the received sequence for that subscriber in the session usage database 515. The television receiving apparatus 350 stores the received sequence of channel IDs in the local storage device 415 (Fig. 5).

The microprocessor 410 of the subscriber's television receiving apparatus 350 may control the tuner 390 (Fig. 5) to tune to the information channels corresponding to stored channel IDs to receive the information selected for that subscriber.

That is, the tuner 390 sequentially tunes to the information channel corresponding to each stored channel ID for the INFO duration specified for that information channel.

5 It is noted that only authorized subscribers, i.e., authorized television receiving apparatus 350, are permitted to be connected to the head-end 320 and unauthorized television receiving apparatus 350 are inhibited from displaying the sequence of information received from the INFO servers 360 and the program receivable on the broadcast channels.

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20 As described hereinabove with respect to the internet, the login information is generated when authorized television receiving apparatus 350 "turns on" to receive programs from the associated head-end 320 (or connects to the associated head-end 320). The login information is stored in a session usage database 515 or like. The login information may comprise the login time and the login date, but is not limited to such information. For example, the login information may additionally contain a location ID, information relating to the locality of that television receiving apparatus 350. It is appreciated that the location ID may represent a zip code, a telephone number, a country name or code, a state or province name, or like. Alternatively, the login information may be transmitted to the

session usage server 510 which generates the session usage record from the login information and stores the session usage record in the session usage database 515. It is appreciated that the session usage record may not necessarily contain all the login
5 information.

Also, it is appreciated that the login time and the login date may be generated in accordance with a network system clock, thereby ensuring accurate and uniform login information from the television receiving apparatus 350. The network system clock may reside in the head-ends 320 or some other server on the satellite 310. Accordingly, the clock information of each television receiving apparatus 350 is not overwritten with the network system clock information, but each television receiving apparatus 350 stamps the information to be transmitted to the associated head-end 320 based on the network system clock. That is, each television receiving apparatus 350 has a real time and a virtual time based on the network system clock, and generates a virtual login time and a virtual login date based on the network
20 system clock.

It is appreciated that the zip code and time zone of the subscriber may also be used to generate the sequence of information for that subscriber. For example, if a particular

information has a display time range of 6:00 PM to 8:00 PM and the current time is 9:00 PM EST (Eastern Standard Time), then this information would not be provided to any U.S. subscribers in the EST time zone, but would be supplied to U.S. subscribers in the Mountain and Pacific time zones. It is appreciated that U.S. subscribers in the EST time zone will receive information having a display time range of 9:00 PM to 10:00 PM. This will advantageously permit the advertisers to target their advertisements based on the geographic location of the subscriber to consider regional preferences. That is, advertisers may want to use one advertisement for people in the east coast and another advertisement for people in the west coast. Also, it is appreciated the time zone and the display time range information may be used to insure that a particular advertisement is shown to all U.S. subscribers only from 6:00 PM to 7:00 PM.

The authorized subscriber selects (requests) a program to view by selecting the desired broadcast channel using the remote control unit 440 or the channel selector 420 on the television receiving apparatus 350. In response, the microprocessor 410 controls the tuner 390 to tune to a selected broadcast channel or a particular broadcast frequency over which the requested program is transmitted. The video signals which constitute the program broadcast over the selected broadcast

channel are supplied to the monitor 370 whereat they are continuously displayed simultaneously with the sequence of information. As stated hereinabove with respect to the internet, the sequence of information and the requested program are
5 displayed on the monitor 370 such that they are simultaneously viewable by the subscriber.

Preferably, the display of the sequence of information on the monitor 370 does not interfere with the display of the requested program. In such a scheme, the sequence of information may be displayed in a first portion of the monitor 370 and the requested program in a second portion of the monitor 370. For simplicity, the two portions of the monitor 370 will be referred hereinafter as a program or browser window 371 and an INFO window 372 as depicted in Fig. 6. Accordingly, the sequence of
10 information is displayed in the INFO window 372 and the requested program is displayed in the program window 371. It is appreciated that each information in the sequence is displayed on the INFO window 372 for the assigned INFO duration, e.g., first
15 information may be displayed for 30 seconds, second information for 15 seconds, etc.

As stated hereinabove with respect to the internet, the INFO window 372 may include unlinked regions 374 and linked

regions 373 such as "Preview Programs", "Merchandise", "New Products" or "Order Now" as shown in Fig. 6. Each of the linked regions 373 may be linked to an INFO server 360 or a broadcasting station 310 (a data provider) on the satellite 310. The subscriber may click one of the linked regions 373 to preview new programs, receive additional information relating to merchandise and new products or to place an order. For example, if the subscriber clicks the linked region 373 labeled "Preview Programs" in Fig. 6, the television receiving apparatus 350 will be tuned to a broadcast channel or an INFO channel to display the program receivable on that channel on the program window 371. Additionally, the INFO window 372 may display a program that is currently receivable on a broadcast channel such as channel 10 and the subscriber may tune to channel 10 by simply clicking on the display of that program. That is, the linked region 373 may be connected to the microprocessor 410 of the television receiving apparatus 350 to control the tuner 390 to select the broadcast channel transmitting the program currently displayed on the INFO window 372. Preferably, as described hereinabove with the internet, the additional information displayed in the program window 371 may depend on the subscriber's profile data. It is appreciated that the linked regions 373 are not limited to those depicted in Fig. 6 and other linked regions are contemplated in the present invention.

Alternatively, if the subscriber clicks the linked region 373 labeled "Preview Programs," a pop-up window may be displayed on the program window 371 wherein the subscriber may be requested to complete a questionnaire form or to provide e-mail address, home address, fax number or like to receive a complementary copy of a video containing the program or a promotional brochure on the program. It is appreciated that the requested data may be retrieved from the profile database 1222 and displayed in the program window 371. The subscriber may accept (confirm) this retrieved data or modify the data so as to provide the additional information to another person. After the requested data is either entered or selected by the subscriber, the television receiving apparatus 350 transmits the requested data to the associated head-end 320 via the data link 341. Preferably, the associated head-end 320 stores or updates the subscriber's additional profile information in the additional profile database 286 in accordance with the completed questionnaire form or the requested data. Alternatively, the ISP server 110 retrieves the profile data associated with the subscriber from the profile database 326, and stores or updates the subscriber's additional profile information in the additional profile database 326 in accordance with the completed questionnaire form or the requested data, subscriber ID and the subscriber's profile data. It is appreciated that this

advantageously permits the present invention to provide a mechanism for interactive communication between the subscriber and the INFO provider. Also, other means of providing the requested data is contemplated such as a radio button for
5 exclusive selections, check boxes for multiple selections and like.

It is appreciated that although the subscriber cannot control the display of the sequence of information on the INFO window 372 of the monitor 370, the subscriber can select another
10 program to be displayed on the program window 371 by selecting another broadcast channel using the remote control unit 440 or the channel selector 420.

Alternatively, the contents of the INFO window 372, each information in the sequence of information, can be characterized as an unsolicited request for a program (data) from one of the broadcasting stations. In other words, the programs displayed on the program window 371 represent solicited programs
15 requested by the subscriber, whereas the materials (programs) displayed on the INFO window 372 represent unsolicited programs not requested by the subscriber. Essentially, without informing the subscriber, the television receiving apparatus 350
20 automatically tunes to a broadcast channel to request (select) a

program that is receivable on that broadcast channel to be displayed on the INFO window 372.

5 Preferably, the broadcast channels (or broadcast stations) may be divided into two groups, wherein the tuner 390 is operable to tune to the first group of broadcast channels in response to a solicited request and second group of broadcast channels in response to an unsolicited request. That is, the microprocessor 410 does not permit the tuner 390 to tune to the second group of broadcast channels in response to a control signal from the remote control unit 440 or the channel selector 420. Any solicited request for programs from the second group of broadcast channels is denied and the program window 371 may display a message such as "channel unavailable".

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20 When the television receiving apparatus 350 is determined to be disconnected from the associated head-end 320, the associated head-end 320 generates the logout information and stores the information in the session usage database 515. As stated hereinabove with respect to the internet, the logout information may comprise the logout time and the logout date, but is not limited to such information. Alternatively, each television receiving apparatus 350, namely the microprocessor 410, may generate the logout information if the subscriber

disconnects the television receiving apparatus 350 from the associated head-end 320 by "turning off" the television receiving apparatus 350. It is appreciated that each television receiving apparatus 350 may generate the logout time and the logout date using the virtual clock rather than its internal clock to ensure accurate and uniform logout information.

Alternatively, the associated head-end 320 transmits the logout information to the session usage server 510. Similar to the session usage server 210 in Fig. 1, the session usage server 510 generates the session duration information as a function of the subscriber's stored login date, the subscriber's stored login time, the received logout date and the received logout time. The session usage server 510 updates the session usage record of the subscriber in response to the received logout date, the received logout time and the session duration information, and stores the updated session usage record in the session usage database 515. The updated session usage record of the subscriber may be used along with the subscriber's profile data to select the sequence of information for the subscriber. That is, the data generated from the current session for the subscriber may be used to generate the sequence of information for the next session. It is noted that the current session

implies the subscriber's current connection to the associated head-end 320.

It is appreciated that the television receiving apparatus 350 may be disconnected from the associated head-end 320 due to faulty connection, hardware and software problems, power outage, etc. Preferably, to account for such disconnections, each television receiving apparatus 350 generates a ping signal every predetermined interval, e.g., every 5, 10 or 15 minutes and transmits the ping signal to the associated head-end 320. It is appreciated that the ping signal may include information identifying the source of the ping signal such as the subscriber ID and channel ID indicating the subscriber's selected channel.

The associated head-end 320 forwards the ping signal to the session usage database 515. It is contemplated that the session usage database 515 stores information relating to the expected time of the next ping signal for each subscriber. When the television receiving apparatus "turns on" to connect to the associated head-end 320, the session usage database 515 sets the expected time of the next ping signal for that subscriber to the current time plus a multiple number of the predetermined ping signal interval. That is, upon the receipt of login information

from the television receiving apparatus 350, the session usage database 515 sets the expected time of the next ping signal for that subscriber.

5 If a ping signal is received substantially within the
expected time from the television receiving apparatus 350 (the
microprocessor 410), then the session usage database 515 updates
the expected time of the next ping signal for that subscriber.
10 Preferably, the associated head-end 320 may transmit the ping
signal to the session usage server 510 which forwards the ping
signal to the session usage database 515 for processing and
storage. However, if a ping signal is not received substantially
15 within the expected time from that television receiving apparatus
350, then the television receiving apparatus 350 is presumed to
be disconnected from the associated head-end 320. Preferably,
the session usage server 510 transmits a disconnect signal to the
associated head-end 320 to disconnect that television receiving
apparatus 350 from the associated head-end 320. The session
usage server 510 also generates and transmits the logout
20 information for that subscriber to the session usage database 515
for storage. It is appreciated that the disconnect signal and
logout information may be generated by the associated head-end
320 and transmitted to the session database 515 for storage.

As stated hereinabove with respect to the internet, it is appreciated for transmission efficiency and security the ping signal may be encrypted and compressed using standard encryption and compression techniques before it is transmitted to the associated head-end 320. In such a scenario, the session usage server 510 decrypts and decompresses the ping signal before updating the expected time of the next ping signal.

As stated hereinabove with respect to the internet, since the information displayed to the subscribers may represent advertisements, it may be important to keep track of what advertisements were transmitted and displayed to the subscribers. This information may be used to directly determine the number of people who viewed a particular advertisement. It is appreciated that this is comparable to Nielsen's or Arbitron's rating scheme for television and radio, except the present technique provides a more precise and detailed measurement of the viewing habits of the subscribers. That is, the present technique advantageously permits a more accurate demographic profile to be developed for each subscriber, thereby enabling the advertisers to selectively target their advertisements more effectively.

Accordingly, for each subscriber, the preferred embodiment of the present invention determines which information

in the sequence of information was displayed to that subscriber based on the INFO durations and the subscriber's session usage record stored in the session usage database 515. Specifically, the subscriber's stored session duration information or the subscriber's stored login time, stored login date, stored logout time and stored logout date of the subscriber's session usage record may be used to determine which information was displayed on the television receiving apparatus 350. The result of this determination may be compiled as a list to provide a list of displayed information. This list of displayed information is then stored in an INFO display database 525 or like. It is appreciated that the list of displayed information may be stored in the local storage device 415 (Fig. 5) of the television receiving apparatus 350 before the list is transmitted to the INFO display database 525. Also, it is appreciated that this list of displayed information for each subscriber may be a list of INFO IDs and INFO durations corresponding to the information that was displayed to that subscriber.

The list of displayed information for each subscriber may additionally contain the subscriber ID and information relating to the display date and display time that a particular information in that list of displayed information was displayed to that subscriber. It is appreciated that the display date and

the display time information may be derived from the INFO durations and the subscriber's session usage record stored in the session usage database 515, namely from subscriber's login time, login date, logout time and logout date.

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10 The list of displayed information for each subscriber
15 may further contain information relating to the locality of that
20 television receiving apparatus 350, namely the location ID.
Alternatively, the list of displayed information for each
subscriber may be transmitted to the session usage server 515
which generates an INFO display record for each INFO ID in that
list of displayed information and stores the INFO display record
in the INFO display database 525. It is appreciated that the
session usage server 510 may not necessarily use all of the
information contained in the list of displayed information to
generate the INFO display record. Also, the INFO display record
of the subscriber may be used along with the subscriber's profile
data to select the sequence of information for the subscriber.
That is, the information displayed to the subscriber in his/her
current session may be used to generate the sequence of
information for the next session.

In addition, for each displayed information, the present invention keeps track of all of the linked regions 373

selected (or clicked) by each subscriber during the display of that information to provide a linked region ID. This information may be used to determine the subscriber's interest in a particular product, company, channel or like, providing a more accurate information on the viewing habits of the subscriber. Also, this information may be used to develop a targeted advertising strategy, where the advertisers can determine the subscribers who are more likely to be interested in receiving such information. It is appreciated that since each linked region 373 is connected to a particular data provider (i.e., broadcasting station or INFO server), each linked region ID may represent a selected data provider ID.

If it is determined that at least one linked region 373 has been selected by a subscriber, the television receiving apparatus 350 associated with that subscriber generates and transmits a clicked event report packet to the associated head-end 320. It is appreciated that the television receiving apparatus 350 may store the clicked event report packet in the local storage device 415 (Fig. 5) before transmitting the clicked event report packet to the associated head-end 320. The clicked event report packet may contain the subscriber ID of the television receiving apparatus 350, the displayed INFO ID of the displayed information, the selected data provider ID

corresponding to the clicked linked region 373, the date and time the information was displayed on the television receiving apparatus 350 to provide the display date and the display time of the displayed information, and the location ID defining the locality of the television receiving apparatus 350. It is appreciated that the television receiving apparatus 350 may generate the display date and display time using the virtual clock rather than its internal clock to ensure accurate and uniform information. Also, it is appreciated that the clicked event report packet may be encrypted and compressed before it is transmitted to the associated head-end 320 for transmission efficiency and security purposes.

The associated head-end 320 forwards and stores the received clicked event report packet in the clicked event database 535. Alternatively, the associated head-end 320 may forward the clicked event report packet to the clicked event server 530 which decrypts and decompresses the received clicked event report packet, and generates a clicked event record. The clicked event record is then stored in the clicked event database 535. It is appreciated that the clicked event server 530 may not necessarily use all of the information in the clicked event report packet to generate the clicked event record. Also, the clicked event record of the subscriber may be used along with the

subscriber's profile data to select the sequence of information for the subscriber. That is, the information selected by the subscriber in his/her current session may be used to generate the sequence of information for the next session.

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Further, it may be advantageous to keep track of the broadcasting channels selected by the subscriber to develop a more precise profile on each subscriber. Thereby, enabling the advertisers to better select their target audience (subscribers) for their promotions, advertisements and like.

Accordingly, for each subscriber, the present invention determines all the broadcasting channels selected by that subscriber and stores the corresponding data provider IDs in the primary session log database 545. It is appreciated that each time a new broadcast channel is selected to display the program receivable on that selected broadcast channel on the program window 371, the television receiving apparatus 350 associated with that subscriber may generate and transmit the session log packet to the associated head-end 320. It is appreciated that the television receiving apparatus 350 may store the session log packet in the local storage device 415 before transmitting the session log packet to the associated head-end 320. The session log packet may contain the subscriber ID of the television

receiving apparatus 350, the data provider ID of the broadcast channel selected by the subscriber, the date and time the program receivable on the selected (requested) broadcast channel was displayed on the television receiving apparatus 350 to provide the display date and the display time of the requested program, and the location ID defining the locality of the television receiving apparatus 350. Also, it is appreciated that the television receiving apparatus 350 may generate the display date and display time using the virtual clock rather than its internal clock to ensure accurate and uniform information. Further, it is appreciated that the session log packet may be encrypted and compressed before it is transmitted to the associated head-end 320.

The associated head-end 320 forwards and stores the received session log packet in the primary session log database 545. Alternatively, the associated head-end 320 may forward the session log packet to the session log server 540 which decrypts and decompresses the received session log packet, and generates the primary data display record. The primary data display record is then stored in the primary session log database 545.

Also, the session log server 540 may forward a request for profile data associated with the subscriber ID to the head-

ends 320. Each head-end 320 searches its profile database 325 for the requested profile data corresponding to the subscriber ID. When the requested profile data is located by the associated head-end 320, the associated head-end 320 forwards the requested profile data to the session log server 540. The session log server 540 additionally generates a secondary data display record substituting the subscriber ID information in the primary data display record with the profile data information associated with that subscriber ID. The secondary data display record is then stored in the secondary session log database 546. That is, the session log server 540 may combine information from the various databases to generate a customized record. For example, a record may be created to provide viewing habits of subscribers belonging to a particular demographic group such as married male under 35 with annual income exceeding \$100,000 living in New York City. It is appreciated that the session log server 540 may not necessarily use all of the information in the session log packet to generate the primary and secondary data display records.

Further, the data display record of the subscriber may be used along with the subscriber's profile data to select the sequence of information for the subscriber. That is, the broadcast channels selected by the subscriber in his/her current

session may be used to generate the sequence of information for the next session.

While the present invention has been particularly shown
5 and described with reference to a preferred embodiment, it will
be readily appreciated that various changes may be made without
departing from the spirit and scope of the invention. For
example, instead of storing the information in various databases,
all of the information may be stored in a single database or a
10 single storage device. Also, the information such as the clicked
event report, the session log packet and like may be stored in
the subscriber terminal 130 and the television receiving
apparatus 350 before they are transmitted to the respective
databases for storage via the ISP server 110 and the associated
15 head-end 320, respectively. This advantageously permits the
subscriber terminal 130 and the television receiving apparatus
350 to queue the information and transmit the information in bulk
to the ISP server 110 and the associated head-end 320,
respectively, during off-peak hours when the network is less
20 congested.

Additionally, instead of storing the profile data and
additional profile data in the profile databases 325 and
additional profile databases 326 associated with each head-end

320, they may stored in a single profile database 325 and a single additional profile database 326 connected to the satellite 310.

5 Further, it is appreciated that each server and database may be mirrored for redundancy to provide a more reliable and robust system. The information stored in various databases may be additionally backed up in a central database every predetermined interval or during off-peak hours to provide recoverability, efficiency and security. Alternatively, each database may backup another database so that there is always a primary and secondary databases for any given information.

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